

## HiBarSens<sup>®</sup> 2.0

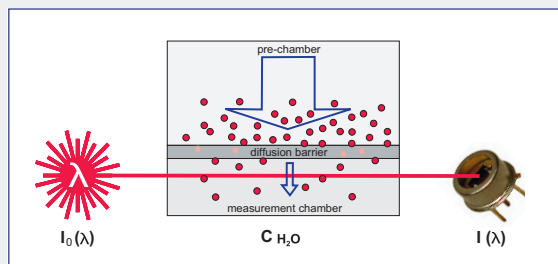
### Making ultra-high barrier measurements even better



Beyond mechanical protection, packaging material for food and pharmaceuticals have another important further function: They have to protect the products against atmospheric gases. Especially water vapor and oxygen are critical to the quality of these products.

Novel flexible optoelectronic devices such as OLED's and organic solar cells require barrier properties which are in the range of  $(WVTR) < 10^{-6} \text{ g[H}_2\text{O]} \text{ m}^{-2} \text{ d}^{-1}$ .

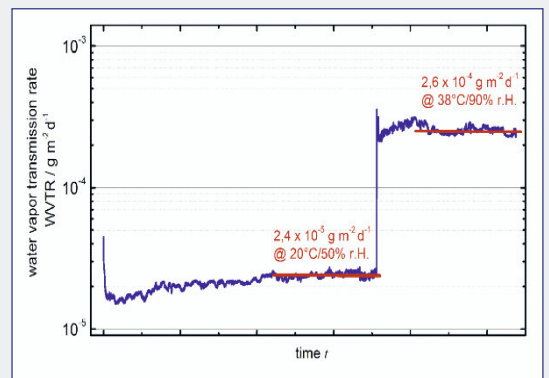
HiBarSens<sup>®</sup> is meeting those requirements from research and industry to measure WVTR down to this range.



measurement principle

#### Principle

Laser spectroscopic trace gas analysis is the basis of this novel measuring device. Apart from the possibility to reliably detecting gases within the range of ultra traces (ppb) neither a drift of the sensor nor a hysteresis of the sensor appears due to the optical measuring system. Additionally the measurement takes place very close to the barrier foil which avoids a time delay.



Permeation measurement of ultra barrier materials by HiBarSens<sup>®</sup> 2.0 (diffusion mode)

#### New unique Features

HiBarSens<sup>®</sup> 2.0 offers uniquely 3 measurement modes. Beside the standard DYNAMIC mode, which uses a carrier gas flow through the permeation cell to ensure steady-state-conditions also the two advance modes: DIFFUSION and COMBINATION. Both of the advanced modes open access to measure  $10^{-6} \text{ gm}^{-2} \text{ d}^{-1}$ . With HiBarSens<sup>®</sup> 2.0 an updated version of our successful ultra-high barrier measurement system is launched. Our consequent, continuous development and improvement program has led to a completely reworked platform enabling several uniquely new features to HiBarSens<sup>®</sup> available in optional configurations:

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**HiBarSens<sup>®</sup> 2.0 HT**

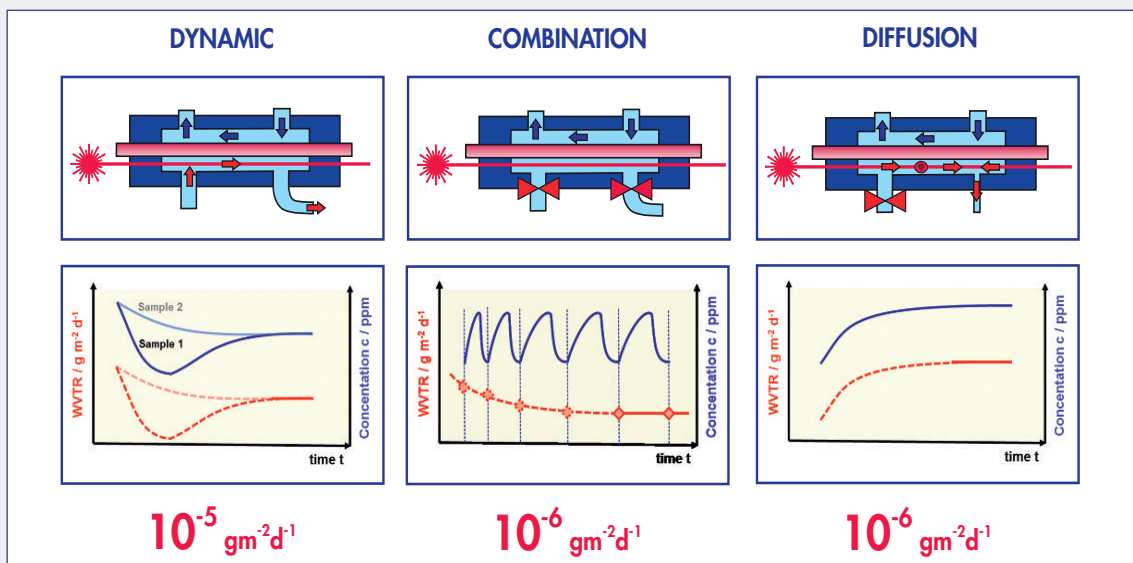
We are proud to offer a breakthrough in development to offer first a system which is able to measure up to 85°C, so enabling the important damp heat measurement conditions.

**HiBarSens<sup>®</sup> 2.0 RSS**

This option enables to measure Reduced Sample Sizes. Often customers work in R&D on 4" sample sizes and the RSS version of HiBarSens<sup>®</sup> 2.0 offers all unique features of HiBarSens<sup>®</sup> 2.0 also for smaller samples

**HiBarSens<sup>®</sup> 2.0 HT RSS**

Combination of high temperature and reduced sample size of 4".



One System – Three Measurement modes

**Result** The water vapor permeation measurement system HiBarSens<sup>®</sup> 2.0 has been designed and tested to study the water vapor transmission rate of ultra-high barrier films.

**At a Glance**

**Featuring Laser Diode Spectroscopic Gas Sensor**

- › Unsurpassed sensitivity
- › Huge dynamic range
- › Highest selectivity
- › No sensor maintenance
- › Extreme long-time stability
- › No drift due to saturation or over-drying
- › Permeate detection close to sample
- › Measurement under typical application conditions (pressure, temperature, moisture)

**ActiveSeal technology to suppress ambient humidity effect**

**Specification**

- Permeate:** H<sub>2</sub>O
- Measurement range:** Dynamic: 10<sup>-5</sup> – 2 g[H<sub>2</sub>O]m<sup>-2</sup>d<sup>-1</sup>  
Combination and diffusion: 10<sup>-6</sup> – 10<sup>-2</sup> g[H<sub>2</sub>O]m<sup>-2</sup>d<sup>-1</sup>
- Sensor:** Laser Diode Spectroscopic Gas Sensor
- Temperature range:** 10 °C to 50 °C ± 0,05 °C  
HT version: 10 °C to 85 °C ± 0,05 °C
- Rel. humidity range:** 60 % to 95 % r.H. ± 2 %  
100% r.H. (optional)
- Sample size:** Ø 200 mm  
Ø 95 mm (RSS version)
- Sample thickness:** 20 µm to 5 mm
- Dimension:** 570 x 355 x 380 mm
- Weight:** approx. 35 kg
- Power supply:** 100-230 V AC 50-60 Hz through HiBarSens<sup>®</sup> 2.0 PowerBox
- Peripherals:** HiBarSens<sup>®</sup> 2.0 PowerBox, HiBarSens<sup>®</sup> 2.0 Chiller